Docket No.: 8540G-000216 (GP-303519)
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Harald Schlag

Application No.: 10/771,917

Filed: February 4, 2004 Art Unit: 1745

For: Durable, Low Transient Resistence Between Biopolar Plate and Diffusion Media Examiner: Helen Chu

APPEAL BRIEF

MS Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

As required under § 41.37(a), this brief is filed within two months of the Notice of Appeal being filed in this case on August 27, 2008, and is in furtherance of said Notice of Appeal.

The fees required under § 41.20(b)(2) are dealt with in the accompanying TRANSMITTAL OF APPEAL BRIEF.

This brief contains items under the following headings as required by 37 C.F.R. § 41.37 and M.P.E.P. § 1206:

I. REAL PARTY IN INTEREST

The real party in interest for this appeal is:

General Motors Corporation

II. RELATED APPEALS, INTERFERENCES, AND JUDICIAL PROCEEDINGS

There are no other appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

A. Total Number of Claims in Application

There are 28 claims pending in this application.

There are 10 cancelled claims in this application.

B. Current Status of Claims

1. Claims canceled: 15-24

2. Claims withdrawn from consideration but not canceled: none

3. Claims pending: 1-14 and 25-38.

4. Claims allowed: none

5. Claims rejected: 1-14 and 25-38.

C. Claims on Appeal

The claims on appeal are claims 1-14 and 25-38.

IV. STATUS OF AMENDMENTS

All amendments related to pending claims 1-14 and 25-38 have been entered in this application.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Claim 1

A fuel cell is provided including a first polymer electrolyte membrane (PEM) (item 20; Figs. 2-4; [0023], [0024]; pg. 6, lines 3-23), a plate (item 22, 24; Figs. 2-4; [0023], [0025]-[0027]; pg. 6, lines 3-13; pg. 7, line 1 – pg. 8, line 7), a first diffusion media (item 26; Figs. 2-4; [0023]-[0027]; pg. 6, line 3 – pg. 8, line 7) and a first sealing layer (item 40; Figs. 3, 4; [0025]-[0027]; pg. 1, line 1 – pg. 8, line 7). The plate (22, 24) includes a first series of flow channels (item 28, 32; Figs. 2-4; [0023]-[0025]; pg. 6, line 3 – pg. 7, line 12) formed in a first surface and defining a first series of land portions (item 30, 34; Figs. 2-4; [0023]-[0027]; pg. 6, line 3 – pg. 8, line 7) disposed between and separating adjacent flow

channels (28, 32). The first diffusion media (26) is disposed between the first PEM (20) and the plate (22, 24) and is in direct contact with the first surface. The first sealing layer (40) is adhered to the land portions (30, 34) of the plate (22, 24) to secure the direct contact between the first diffusion media (26) and the plate (22, 24) and to seal the first surface.

Claim 25

A fuel cell system is provided including a fuel cell stack having a plurality of fuel cells in electrical series connection. Each fuel cell includes a first polymer electrolyte membrane (PEM) (item 20; Figs. 2-4; [0023], [0024]; pg. 6, lines 3-23), a plate (item 22, 24; Figs. 2-4; [0023], [0025]-[0027]; pg. 6, lines 3-13; pg. 7, line 1 – pg. 8, line 7), a first diffusion media (item 26; Figs. 2-4; [0023]-[0027]; pg. 6, line 3 – pg. 8, line 7) and a first sealing layer (item 40; Figs. 3, 4; [0025]-[0027]; pg. 1, line 1 – pg. 8, line 7). The plate (22, 24) includes a first series of flow channels (item 28, 32; Figs. 2-4; [0023]-[0025]; pg. 6, line 3 – pg. 7, line 12) formed in a first surface and defining a first series of land portions (item 30, 34; Figs. 2-4; [0023]-[0027]; pg. 6, line 3 – pg. 8, line 7) disposed between and separating adjacent flow channels (28, 32). The first diffusion media (26) is disposed between the first PEM (20) and the plate (22, 24) and is in direct contact with the first surface. The first sealing layer (40) is adhered to the land portions (30, 34) of the plate (22, 24) to secure the direct contact between the first diffusion media (26) and the plate (22, 24) and to seal the first surface.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A. Whether the rejection of claims 1-14 and 25-38 under 35 U.S.C. §102(b) as anticipated by or in the alternative under 35 U.S.C. §103(a) as obvious over Schmid et al. (U.S. Pat. No. 6,495,278) is improper.

VII. ARGUMENT

A. Schmid et al. (U.S. Pat. No. 6,495,278) fails to anticipate or render obvious the features of claims 1 and 25.

At the outset, Applicant notes that Schmid fails to teach or suggest the sealing layer of claims 1 and 25. In rejecting claims 1 and 25, the Office Action mailed May 30, 2008 (hereinafter "the Office Action") indicates that "a sealing layer (component 50) adheres the land portions of said plate to secure direct contact between the first diffusion media and the separator." The Office Action references Figures 3a and 5a of Schmid when defining the polymer electrolyte membrane (PEM), plate, diffusion media and sealing layer. Figures 3a and 5a are reproduced below:

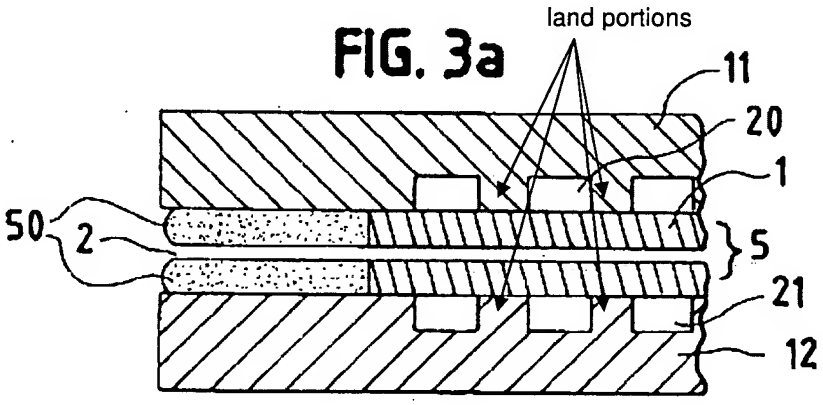
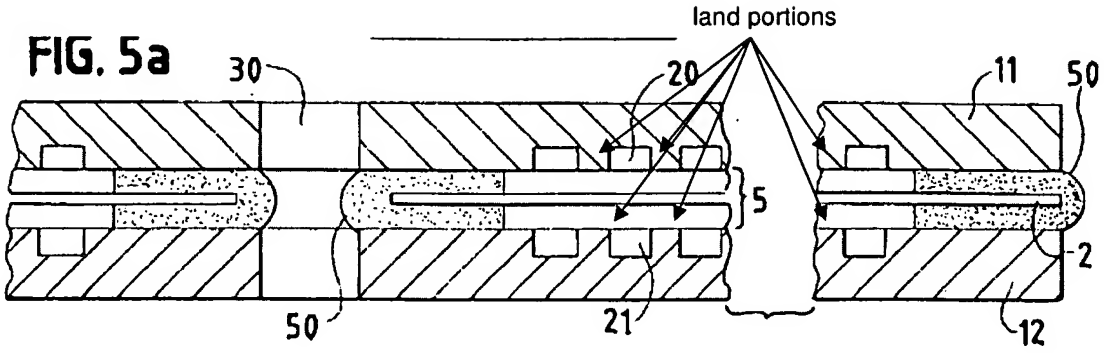


FIG. 5a



Specifically, the Office Action characterizes elements (20) and (21) as the claimed flow channels and element (50) as the claimed sealing layer. Schmid characterizes element (5) as the membrane electrode assembly (MEA) including the PEM (2) disposed between porous electrodes (1), (3). Claims 1 and 25 each define the sealing layer as "adhered to land portions of said plate to secure direct contact between said first diffusion media and said plate." Claims 1 and 25 each define the claimed land portions as "being disposed between and separating adjacent flow channels."

As indicated in Schmid, "[a]dhesive bonding agent 50, used for sealing the gas spaces, runs along the outer edges of MEA 5." (col. 6, lines 58-60). While the adhesive bonding agent (50) of Schmid may engage the MEA (5), it does so at regions outside of the flow channels (20, 21) and outside of the land portions adjacent to the flow channels. In order to better illustrate the distinction between the claims and the teachings of Schmid, Applicant has labeled what would reasonably be considered the land portions in Schmid in Figures 3a and 5a above. As seen in Figures 3a and 5a and explained in column 6 of Schmid, the "sealing layer 50" is <u>not</u> located between adjacent flow channels and adhered to the land portions as claimed. Rather, the "sealing layer 50" surrounds an outer periphery of the MEA (5).

As indicated above, the Office Action indicates Schmid discloses "a sealing layer (component 50) adher[ing] the land portions of said plate to secure direct contact between the first diffusion media and the separator." However, as indicated in the description and drawings of Schmid referenced above, this statement is not supported.

Further, in response to similar arguments previously presented by Applicant and requests for clarification as to how Schmid teaches an adhesive layer adhered to the land portions of Schmid, the Office Action additionally considers element (30) of Schmid to be a flow channel. Applicant respectfully disagrees with this characterization of Schmid as Schmid clearly indicates and Figure 2 clearly shows that element (30) is a fluid manifold opening, not a flow channel as claimed. Rather, as indicated above and in the body of the rejection of the Office Action, elements (20) and (21) are properly considered the flow channels in Schmid and teach away from the interpretation of Schmid suggested by the Office Action.

Therefore, Applicant respectfully submits that claims 1 and 25 are in condition for allowance. Claims 2-14 depend from claim 1 and claims 26-38 depend from claim 25 and should be in condition for allowance for the reasons set forth above. Reconsideration and withdrawal of the rejection of claims 1-14 and 25-38 are respectfully requested.

VIII. CLAIMS

A copy of the claims involved in the present appeal is attached hereto as Appendix A.

IX. EVIDENCE

No evidence pursuant to §§ 1.130, 1.131, or 1.132 or entered by or relied upon by the examiner is being submitted. An attachment is provided at Appendix B indicating such.

X. RELATED PROCEEDINGS

No related proceedings are referenced in II. above, or copies of decisions in related proceedings are not provided. An attachment is provided at Appendix C indicating such.

Dated: September 26, 2008 Respectfully submitted,

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APPENDIX A

Claims Involved in the Appeal of Application Serial No. 10/771,917

1. A fuel cell, comprising:

a first polymer electrolyte membrane (PEM);

a plate having a first series of flow channels formed in a first surface and defining a first series of land portions disposed between and separating adjacent flow channels;

a first diffusion medium that is disposed between said first PEM and said plate and that is in direct contact with said first surface; and

a first sealing layer adhered to said land portions of said plate to secure said direct contact between said first diffusion media and said plate and to seal said first surface.

2. The fuel cell of claim 1 wherein said first sealing layer is an epoxy resin.

3. The fuel cell of claim 1 wherein said first sealing layer is electrically conductive.

4. The fuel cell of claim 1 wherein said first sealing layer is electrically non-conductive.

5. The fuel cell of claim 1 wherein said first diffusion media is in direct contact with said first series of land portions.

6. The fuel cell of claim 1 wherein said first sealing layer is initially applied to said first surface in a non-cured state and a portion of said first diffusion media is immersed through said first sealing layer to contact said first surface, said first sealing layer achieving a cured state to secure said first diffusion media to said first surface.

7. The fuel cell of claim 1 further comprising:

a second series of flow channels formed in a second surface of said plate;

a second diffusion medium that is disposed between a second PEM and said plate and that is in direct contact with said second surface; and

a second sealing layer that secures said direct contact between said first diffusion media and said plate and that seals said second surface.

8. The fuel cell of claim 7 wherein said second sealing layer is an epoxy resin.

9. The fuel cell of claim 7 wherein said second sealing layer is electrically conductive.

10. The fuel cell of claim 7 wherein said second sealing layer is electrically non-conductive.

11. The fuel cell of claim 7 further comprising a second series of lands formed in said plate, wherein said second diffusion media is in direct contact with said second series of lands.

12. The fuel cell of claim 7 wherein said second sealing layer is initially applied to said second surface in a non-cured state and a portion of said second diffusion media is immersed into said second sealing layer to contact said second surface, said second sealing layer achieving a cured state to secure said second diffusion media to said second surface.

13. The fuel cell of claim 7 wherein said plate is a bipolar plate, wherein said first series of flow channels facilitate a cathode feed gas flow and said second series of flow channels facilitate an anode feed gas flow.

14. The fuel cell of claim 13 wherein said plate includes cooling channels formed therethrough.

25. A fuel cell system, comprising:

a fuel cell stack including a plurality of fuel cells in electrical series connection, each of said plurality of fuel cells comprising:

a polymer electrolyte membrane (PEM);

a cathode plate having a series of cathode flow channels formed in a cathode surface thereof and defining a first series of land portions disposed between and separating adjacent cathode flow channels;

a first diffusion medium that is disposed between said first PEM and said plate and that is in direct contact with said cathode surface; and

a first sealing layer adhered to said land portions of said cathode surface to secure said direct contact between said first diffusion media and said plate and to seal said cathode surface.

26. The fuel cell system of claim 25 wherein said first sealing layer is an epoxy resin.

27. The fuel cell system of claim 25 wherein said first sealing layer is electrically conductive.

28. The fuel cell system of claim 25 wherein said first sealing layer is electrically non-conductive.

29. The fuel cell system of claim 25 wherein said first diffusion media is in direct contact with said first series of land portions.

30. The fuel cell system of claim 25 wherein said first sealing layer is initially applied to said cathode surface in a non-cured state and a portion of said first diffusion media is immersed through said first sealing layer to contact said cathode surface, said first sealing layer achieving a cured state to secure said first diffusion media to said cathode surface.

31. The fuel cell system of claim 25 further comprising:

an anode plate having a series of anode flow channels formed in an anode surface thereof;

a second diffusion medium that is disposed between a second PEM and said anode plate and that is in direct contact with said anode surface; and

a second sealing layer that secures said direct contact between said second diffusion media and said anode plate and that seals said anode surface.

32. The fuel cell system of claim 31 wherein said second sealing layer is an epoxy resin.

33. The fuel cell system of claim 31 wherein said second sealing layer is electrically conductive.

34. The fuel cell system of claim 31 wherein said second sealing layer is electrically non-conductive.

35. The fuel cell system of claim 31 further comprising a second series of lands formed in said anode plate, wherein said second diffusion media is in direct contact with said second series of lands.

36. The fuel cell system of claim 31 wherein said second sealing layer is initially applied to said anode surface in a non-cured state and a portion of said second diffusion media is immersed into said second sealing layer to contact said anode surface, said second sealing layer achieving a cured state to secure said second diffusion media to said anode surface.

37. The fuel cell of claim 31 wherein said cathode and anode plates constitute a bipolar plate, wherein said cathode flow channels facilitate a cathode feed gas flow and said anode flow channels facilitate an anode feed gas flow.

38. The fuel cell system of claim 37 wherein said bipolar plate includes cooling channels formed therethrough.

APPENDIX B

There is no Evidence Pursuant to §§ 1.130, 1.131, or 1.132 or Entered by or Relied Upon by the Examiner being Submitted in the Appeal of Application Serial No. 10/771,917

APPENDIX C

There are no Proceedings Related to the Appeal of Application Serial No. 10/771,917